JACOBSON (N.)

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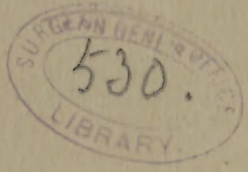

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THE TREATMENT OF COLLES'S FRACTURE.*

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Eighty years ago Abraham Colles described a fracture of the lower end of the radius. To-day we recognize that the injury which bears his name is the most frequent form of fracture. Its treatment has so often resulted unsatisfactorily that it has probably been the occasion of more suits for malpractice than all other forms of fracture combined. It is particularly a subject deserving our earnest consideration.

Rational treatment of an injury rests upon a correct conception of its pathology.

It will be recalled that the deep fascia passing down from the forearm to the wrist is closely connected to the bony structures forming this joint. It is wrapped about the tendons which pass to the hands and fingers, forming resting places for the same. This fascia, secured to both bones and tendons, is spoken of as the annular ligament. Besides this, we have strong ligaments attached laterally

* Read before the Medical Society of the State of New York at its eighty-ninth annual meeting.

on each side. Externally the styloid process of the radius and the scaphoid are secured together, while internally the corresponding process of the ulna is fixed to the cuneiform and pisiform bones. Both of these are intimately attached to the annular ligament. This joint is furthermore protected by an anterior ligament, which is composed of three bands connecting respectively the lower end of the radius, its styloid process and the ulna to the palmar surface of the scaphoid, semilunar, and cuneiform bones. Posteriorly, a ligament less strong secures the lower end of the radius to the three bones of the carpus just mentioned. It will be remembered also that the ulna does not directly articulate with the carpus, but placed between them is the triangular fibro-cartilage, which, attached as it is to both bones of the forearm, serves also as a ligament.

Our most recent text-books still describe this injury as a fracture of the lower end of the radius. The injury to the radius is emphasized. It must be a matter of surprise to the thinking surgeon, if there be merely an uncomplicated fracture of the lower end of the radius, that bad results so frequently follow its treatment. Fractures of a long bone, particularly when superficially placed and guarded by a parallel long bone, do not present ordinarily any obstacles in their care.

But it is evident, upon simply viewing a Colles's fracture, that the deformity is not limited to the radial side of the forearm. Inspecting either the anterior or posterior surface of the wrist, it is at once apparent that there is as much if not more abnormity on the ulnar than on the radial side.

At the annual meeting of this society in 1870, Dr. Edward M. Moore, of Rochester, presented the result of his study of a then recent case of Colles's fracture. It has been said that the condition found by him is not one usu-

ally existing in Colles's fracture. It occurred in a woman who had thrown herself from a great height and had sustained fatal injuries. Colles's fracture, on the contrary, is the result of a slight injury. Yet no one will pretend to say that in a given fracture the extent of damage produced is in each instance the same.

Experimental study has shown that the position of the ulna is so changed in this "fracture" that it is proper to describe the pathological condition as one of dislocation of the lower end of the ulna associated with fracture of the radius. Dr. Moore found, in the case referred to, the internal lateral ligament stripped from its styloid attachment and the triangular fibro-cartilage torn off. The ulna, freed from its ligamentous restraint, became entangled in the deep fascia known as the annular ligament. To this entanglement rather than the radial fracture he attributed the deformity produced. Dr. Moore also found that the tendon of the extensor carpi ulnaris—which, passing through the annular ligament, is placed normally between the head of the bone and its styloid process—was thrown out of place in such a manner as to favor this entanglement of the ulna in the annular ligament and secure it in this position. In a paper presented ten years later to this society additional evidence was adduced corroborating these views.

Dr. L. S. Pilcher placed before the New York Academy of Medicine, at a meeting held May 16, 1878, the result of his experimental study. He demonstrated that the periosteum was not completely torn off from the posterior surface of the radius, but still remained attached to the upper fragment in such a manner as to secure the lower fragment in its faulty position. Displacement of the lower end of the ulna was in every case apparent. The immobility of the ulna in its abnormal position was, he believed, the result of its fixation by the strong oblique fasciculus of the

anterior ligament, to which reference has been made as passing from the inferior extremity of the ulna to the cuneiform bone.

Bardenheuer, in an elaborate article upon injuries to the upper extremities, which appeared in 1888 as part of Billroth and Luecke's *Deutsche Chirurgie*, describes as occurring in connection with fracture of the lower end of the radius at least six degrees or forms of dislocation.

Tillmanns, in the third edition of his *Operative Surgery*, just issued in Germany, refers to luxation of the ulna and fracture of its styloid process as complicating fractures of the lower end of the radius.

Tillaux, in his *Treatise upon Clinical Surgery*, issued from the press during the past year, says that he has had occasion in several instances to dissect these fractures occurring in people who, after receiving the injury, had died of intercurrent affections, and each time found the ulnar styloid process broken, though its occurrence remained unrecognized during life.

Occasionally I have seen injuries which I regarded as simple uncomplicated fractures of the lower end of the radius. But these did not present the deformity characteristic of Colles's fracture. Where the clinical picture which we recognize as that of Colles's fracture is present, it is evident from what has just been stated that there exists, in addition to the radial fracture, a fixed displacement of the lower end of the ulna.

The questions which now present themselves are, first, How can we return both bones to their normal position? and, second, By what means can they be secured when replaced?

Although not agreeing as to the cause and persistence of the ulnar dislocation, both Moore and Pilcher are agreed that extension combined with pressure upon the fragments

of the radius fails to overcome the deformity in Colles's fracture. But by first extending, then carrying the hand to the radial side and bringing it as far backward as possible, the ulna is released from its entanglement. Moore advised, further, to replace the tendon of the extensor carpi ulnaris, that the hand be swung from its backward position to the ulnar side, and completing circumduction by forcing the hand finally into a position of flexion. During this manœuvre an assistant holds the forearm, and the hand of the patient is grasped by the corresponding hand of the surgeon. While the traction and manipulations are being carried out, the opposite hand of the surgeon is so placed that the thumb presses against the lower end of the ulna, thus forcing this bone upward and into place, and secures at the same time the return of the extensor carpi-ulnaris tendon to its proper position if it be found misplaced.

For the purpose of completely relaxing the ligaments which are responsible for the displacement it is wise to administer an anæsthetic. Without it the operation is painful, and the patient unavoidably resists the surgeon, so that reduction is not as easily or satisfactorily accomplished.

That the first step in the treatment of a fracture is its reduction no one will deny. In the treatment of so-called Colles's fracture not only is this emphatically true, but, when once completely reduced, the displacement can not be reproduced by any ordinary movement.

Most surgical works content themselves with stating that reduction of the fracture can be accomplished by extension combined with direct pressure upon the lower fragment either with or without the aid of an anæsthetic. This procedure does not recognize the ulnar complication, and therefore fails to accomplish the desired result. For myself, I have followed the teaching of Dr. Moore, and I must confess that I have not met the serious deformities and the

useless hands which have caused so much suffering and litigation.

As opposed to the very meager reference to the method of reduction, our text-books and special works upon fractures and dislocations devote many pages to the question of after treatment. Exhaustive descriptions of numberless splints recommended by various surgeons, with illustrations of the same, can be found in all of these works.

It is self-evident that no kind of splint or dressing can secure a good result for an unreduced Colles's fracture. Too much emphasis can not be laid upon the fact that the whole secret of success rests with the proper reduction of the fracture. Once properly reduced, it is a matter of no consequence whether an anterior or posterior splint or both be used, whether the splints be straight or pistol-shaped, whether they be simple in their construction or complicated mechanical contrivances.

I must confess never to have had any experience with any kind of splint. Having reduced the so-called fracture, I have placed, as suggested by Dr. Moore, a single-headed roller bandage, two inches in length and half an inch in diameter, under the ulna from the pisiform bone upward, and secured it in place by an equally broad adhesive strap which encircles the wrist. The forearm is placed in a narrow sling; the hand, in a slightly prone position, overhangs the same, and by its own weight secures the ulna in its normal position. Some swelling follows the first dressing. It is therefore advisable to split the adhesive strap upon its dorsal surface immediately. After a few days no further swelling occurs, and a new dressing can be applied, which remains intact.

As a matter of fact, reduction having been accomplished, Nature has provided us with the best kind of splint. The ulna lying at its side prevents any displacement of the

fractured ends of the bone. All that is required is to place and secure this splint in its proper position. The reduction accomplished, the pad and strap, assisted by the position of the hand, secure this end. The patient is given to understand that the sling and pad must remain as placed.

In no other fracture is there such marked tendency to stiffness of the joints and infiltration into the synovial coverings of the tendons. Splints, of whatever character, by their restriction of active and passive movements favor the development of this condition. This has been recognized by surgeons who use splints or fixed dressings, and many of them now advise their daily removal after the second week, to permit passive movements, and their complete removal after twenty days. For myself, I not only permit but advise the patient to move his fingers daily as much as he pleases, and after the first week I institute passive wrist movements. There is no pain during the after-treatment. This freedom from pain I regard as indicative of complete reduction. If pain persists after Colles's fracture, I believe the reduction is incomplete. After three or at most four weeks, the dressing is removed, and the patient finds himself able to use the injured extremity as before and with complete freedom from stiffness or non-use of the extremity.

The very satisfactory results which have followed this line of treatment make it a matter of great surprise to find one of our recent surgical writers recommending as suitable for the treatment of this injury the fixation of the forearm and hand as far as the metacarpo-phalangeal articulation in a plaster-of-Paris bandage. This line of treatment is one which has been pursued extensively in Germany and France. It is so entirely opposed to correct surgical principles that we are prepared to learn from a

German surgeon that the resulting deformity is often extreme, that ulceration, phlegmon, and gangrene of the soft parts are frequently produced.

Bardenheuer, dissatisfied with the plaster-of-Paris treatment, presents what must seem to us a most remarkable alternative. He advises placing the patient in bed and confining him there during the period of treatment. The hand and forearm are placed upon a support with an upward incline. The hand, projecting beyond this splint, has attached to it an extension apparatus the cord of which is carried under a pulley fixed to the bottom of the footboard of the bed and is brought up over a second pulley at the top of the footboard, and to it the weights are attached. The extension is directed in such a manner as to overcome the existing deformity.

As opposed to these complicated methods of treatment, the simplicity of that necessary after proper reduction is apparent to every one. The only extension required is that secured by the weight of the hand. The only splint necessary is the one Nature furnishes—the ulna. There is no reason for producing immobilization of the hand or wrist, which only results in stiffness and non-use. The older methods of treatment, by whatever form of appliance, have served only to bring discredit upon the profession. We are in possession of sufficient knowledge of the pathology and correct views of treatment of this injury to realize that the proper treatment lies in its complete reduction rather than in any form of after-fixation.

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